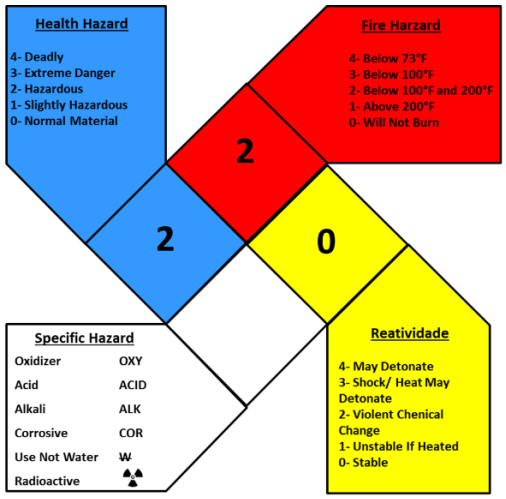
1- IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/UNDERTAKING	
Product identifier:	D-LIMONENE
Relevant identified uses of the substance or mixture and uses advised against:	Natural origin aroma compound fraction or isolation from *Citrus sinensis* orange essential oils by vacuum distillation fractioning, achieving higher purity and high-quality aroma profiles, suitable as raw material to flavor, fragrance, and fine chemicals industry. The product is Food Grade and FTNF-From The Named Fruit (Orange). d-Limonene, as main natural compound of the product is 100% bio-based and is GRAS - Generally Recognized as Safe rated.
Company	CITROSUCO NORTH AMERICA EVERA TAMPA – US CITROSUCO S/A AGROINDÚSTRIA - BRAZIL
Address - US	12161 62nd STREET, SUITE 400 – LARGO, FL 33773 - US
Address - BRAZIL	JOÃO PESSOA, 305 CENTER MATÃO-SP 15990-903
Phone number - US	Tampa Flórida (US) +1 (727) 228-1200
Phone numbers - BRAZIL	Matão +55 16 3383 8500 Catanduva +55 17 3531 6000 Araras +55 19 3321 6000 Santos Terminal +55 13 3279 7900
Technical Responsible, Phone number, Matão Plant (Brazil)	CITROSUCO S/A AGROINDÚSTRIA Technical contact: Oséia Pereira Filho Quality Assurance General Manager +55 16 3383 8555
Technical Responsible, Phone number, USA	CITROSUCO NORTH AMERICA EVERA TAMPA Technical Contact 1: Roberto Amador Head of Citrosuco North America Evera Tampa +1 863-398-0800 +1 727-228-1200

AMBIPAR - INTERNATIONAL EMERGENCY RESPONSE		
AMBIPAR – Brazil and USA Contract number 12518		
In-country Dial Phone Numbers		
Country	**Local or National Number**	**Toll-Free Number**
Australia		1800 865 237
Belgium		0800 71 886
Brazil	+55 11 4349 6274	
China	(400-1) 400 120 1768	
Chile	+ 56 2 3210 0961	
Colombia		01 800 5190040
Czech Republic	+420 296 182 719	
El Salvador	+ 503 2136 1160	
Finland	+358 75 3252470	
Germany		0800 180 3968
Greece		800 848 1066
India		000 800 919 1522
Indonesia		0800 1503250
Italy	+39 024 091 8548	
Japan	0120-692-374	
Lithuania	+370 5 208 0633	
Malaysia		1 800 81 2207
Mexico		800 681 9387
Netherlands	+31 85 064 4048	
New Zealand	+64 9 886 0052	
Romania	+40 377 880 199	

South Africa		080 099 8390
South Korea		00308 491 0213
Spain		900 876 099
Sweden	+46 8 124 003 40	
Taiwan	+886 2 7737 4438	
Thailand		1800 014 752
United Kingdom	+44 330 027 2170	
United States		1 800 219 8391

2- HAZARDS IDENTIFICATION	
Classification of the substance or mixture:	Flammable Liquids – Category 3 Skin sensitization – Category 1 Skin corrosion/irritation – Category 2 Aspiration hazard – Category 1 Hazardous to the aquatic environment – Short-term hazard – Category 2 Hazardous to the aquatic environment – Long-term hazard – Category 2
Classification system adopted:	Regulation (EC) Nº 1272/2008 of the European Parliament and of the Council of 16 December 2008. ABNT-NBR 14725 2023 Global Harmonized System classification and labeling of chemical product.
Label elements:	
Hazard pictograms:	
Signal word:	**DANGER**

Hazard Statement / Hazard Phrases:	**H226** Flammable liquid and vapour. **H304** May be fatal if swallowed and enters airways. **H315** Causes skin irritation. **H317** May cause an allergic skin reaction. **H411** Toxic to aquatic life with long lasting effects.
Precautionary Statement / Precautionary Phrases:	**P210** Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. **P241** Use explosion-proof (electrical/ventilating/lightining/…) equipment. **P262** Do not get in eyes, on skin, or on clothing. **P280** Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/… **P273** Avoid release to the environment. **P301 + P310** IF SWALLOWED: Immediately call a POISON CENTER/doctor/… **P303 + P361 + P353** IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water (or shower). **P370 + P378** In case of fire: Use carbon dioxide (CO_2), foam, water mist and chemical powder to extinguish. **P331** Do not induce vomiting. **P405** Store locked up. **P501** Dispose of contents/container in accordance with local/national/international regulations.

Hommel Diagram / Hazard Diagram / HMIS ® ratings	

3- COMPOSITION / INFORMATION ON INGREDIENTS	
SUBSTANCE	D-LIMONENE
SYNONYMS	1-methyl-4-prop- 1-en-2-yl- cyclohexene; dl-limonene (racemic); Dipentene (R)-p- mentha-1,8-diene; (d-limonene); (S)-p- mentha-1,8-diene; (l-limonene); LIMONENE
PRODUCT IDENTIFIERS	CAS NUMBER: 5989-27-5 EC LIST NUMBER/EINECS: 227-813-5 FEMA: 2633 JECFA: 1326 FLAVIS: 1.045 COE: 491 INCI NAME: LIMONENE UN NUMBER: 2319 UN NAME: TERPENE HYDROCARBONS, N.O.S.
PRODUCT COMPOSITION	D-LIMONENE = 95.0 to 98.9%

	Other Hydrocarbons = 1.1 to 5.0%
Botanical Specie	*Citrus sinensis* (L.) Osbeck
Orange Variety	A blend of main orange varieties: Hamlin, Pera Rio, Natal and Valencia.
Fruit Origin	Brazil and/or United States.
Impurities and stabilizing additives contributing to the hazard:	There are no impurities or stability additives that contribute to the hazard.

4- FIRST AID MEASURES	
Description of first aid measures	
Inhalation:	Remove victim to fresh air and keep resting in a comfortable position for breathing. In all cases of doubt, or when symptoms persist, seek medical advice.
Skin contact:	Take off immediately all contaminated clothing. Rinse skin with water or shower. In case of irritation or in all cases of doubt, or when symptoms persist, seek medical advice.
Eye contact:	Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do and rinse again. If eye irritation persists: Consult a doctor. In all cases of doubt, or when symptoms persist, seek medical advice.
Ingestion:	Do not induce vomiting. Rinse the victim's mouth with water. Never give anything by mouth to an unconscious person. In all cases of doubt, or when symptoms persist, seek medical advice.
Most important symptoms and effects, both acute and delayed:	May be fatal if swallowed and enters airways.
Indication of any immediate medical attention and special treatment needed:	Avoid contact with the product to help the victim. Keep victim warm and quiet. Symptomatic treatment should comprise mainly supportive measures such as correction of electrolyte disturbances, metabolic, and respiratory support. In case of contact with the product, do not rub the

	affected site. In all cases of doubt, or when symptoms persist, seek medical advice.

5- FIREFIGHTING MEASURES	
Extinguishing media:	Appropriate: Compatible with foam, water mist, carbon dioxide (CO_2) and chemical powder. Not recommended: Water jet directly on the burning liquid.
Special hazards arising from the substance or mixture:	Flammable liquid, combustible liquid. Very dangerous when exposed to excessive heat or other sources of ignition such as sparks, open flames or flames of matches and cigarettes, welding operations, pilot lights and electric motors. Can accumulate static charge by flow or agitation. Vapors from heated liquid can be ignited by static discharge. Vapors are heavier than air and tend to accumulate in low or confined areas, such as sewers, basements, etc. Can travel great distances causing retrogression of the flame or new fires in open environments in as confined ones. Containers may explode if heated. The combustion of the chemical products or containers may form toxic and irritant gases such as carbon monoxide and carbon dioxide.
Advice for firefighters:	Wear and use self-contained breathing apparatus (SCBA) operated in positive pressure mode and complete protective clothing that provides protection against heat. Containers and tanks involved in the fire should be cooled with water mist.

6- ACCIDENTAL RELEASE MEASURES	
Personal precautions, protective equipment and emergency procedures	
For non-emergency personnel:	Remove all sources of ignition. Do not smoke. Avoid contact with the product. Do not touch damaged containers or spilled material without the use of appropriate clothing. Use personal protective equipment as described in Section 8.

For emergency responders:	Use full PPE with safety goggles or face shield, butyl rubber, neoprene or PVC safety gloves, suitable protective clothing (long pants and cloth shirts) and closed shoes. In case of leakage, where exposure is large, the use of respiratory protective mask with filter against organic vapors, if necessary, is recommended. Isolate from ignition sources. Evacuate the area within a radius of at least 50 meters. Keep unauthorized persons away from the area. Stop the leakage, if it can be done without risk.
Environmental precautions:	Avoid spillage reaches watercourses and sewerage systems.
Methods and material for containment and cleaning up:	Use water mist or vapor suppressing foam to reduce the dispersion of the vapors. Do not allow water ingress into the containers. Use natural barriers or containment of spillage. Collect spilled product and place in appropriate containers. Adsorb the remaining product with dry sand, earth, vermiculite, or other inert material. Place the adsorbed material in appropriate containers and remove them to a safe place. For disposal, proceed according to Section 13 of this SDS.
Reference to other sections:	See Section 8 for information on personal protection equipment. See Section 13 for information on disposal.

7- HANDLING AND STORAGE	
Precautions for safe handling:	Handle in a well-ventilated area or with general system of ventilation/local exhaust. Avoid vapors and mists formation. Avoid exposure to the product. Avoid contact with incompatible materials. Use personal protective equipment as indicated in Section 8. Wash hands and face thoroughly after handling it and before eating, drinking, smoking, or going to the bathroom. Contaminated clothing should be changed and washed before reuse. Remove clothing and protective equipment contaminated before entering eating areas. Keep away from heat, sparks, open flames and hot surfaces. - Do not smoke. Keep container tightly closed. Ground the container vessel and the receiver of the product during transfers. Only use anti-sparking tools. Avoid the accumulation of electrostatic charges. Use electrical equipment, ventilation and lighting explosion proof.

Conditions for safe storage, including any incompatibilities:	Store in a well-ventilated place away from sunlight. Keep container closed. Keep stored at ambient temperature. Keep away from incompatible materials, such as strong oxidizing agents and mineral acids. Recommended packaging materials: Metallic drums of 50, 200 and 210 Liters. Drums can be stacked at a maximum of 3 degrees high. Drums and packages must be kept at upright position during all handling process. During handle, storage, transportation, stuffing and destuffing process, drums or any other container must be kept at upright position with the lid facing up. After first opening the product should be used as soon as possible due to oxidation.
Shelf life	24 months, provided the storage conditions have been respected

8- EXPOSURE CONTROLS/PERSONAL PROTECTION	
Control parameters:	
Occupational exposure limit:	See toxicological information section.
Biological limit:	See ecological information section.
Other limits and values	Not established.
Recommended monitoring procedures	Include product and/or volatile organic compounds analysis of air monitoring residues in process and handle areas.
Exposure controls:	
Engineering controls measures:	Promote direct mechanical ventilation and exhaust system to the outside environment. These measures help reduce exposure to product.
Individual protection measures, such as personal protective equipment:	
Eye/face protection:	Safety goggles and face shield.

Skin protection, hand	Wear suitable gloves, according to EN 374. Type of material: NBR (Nitrile rubber). Material thickness: >= 0,3 mm Breakthrough times, gloves material: >480 min. (permeation: level 6) Alternative: Butyl rubber, neoprene or PVC safety gloves, suitable protective clothing (long pants and cloth shirts) and closed shoes.
Respiratory protection:	Respiratory protective mask with filter against organic vapors, especially with aerosols or mist formation. Type A (against organic gases and vapours, with a boiling point of >=65ºC, color code: Brown.
Thermal hazards:	It does not present thermal hazards.
Environmental exposure control:	The dilution water from the firefighting may cause pollution.

9- PHYSICAL AND CHEMICAL PROPERTIES	
Information on basic physical and chemical properties	
Appearance	Clear Liquid.
Collor	Colorless
Sensory profile	Light terpenic note, pleasant citric odor, easily recognized as orange d-Limonene.
Specific Weight (d25/25ºC)	0.839 to 0.845
Evaporation residue, on drying 85ºC/3h + 110ºC/0,5h	Data not available.
pH	Data not available.
Odour threshold (based on the main compound d-Limonene) by GC-O Olfactometry	8500 / 13700 ug/L, trained/population panelists in orange juice. 34 to 210 ug/L trained panel in ultrapure water
Melting point/Freezing point:	-95.5 ºC
Boiling point	177 ºC

Flash point (ASTM D93, Pensky-Martens, closed cup with agitation)	51 ºC
Flammability	Flammable liquid in accordance with GHS criteria
Evaporation rate:	Data not available.
Auto Flammability/Self ignition	245 ºC
Lower and upper explosion limits	Lower: 39 to 345 g/m3 Upper: 0.7% to 6.1%
Vapour pressure	1.54 mmHg at 25ºC ; 2.0 hPa @ 25ºC
Vapour density	4.7 at 20ºC (air = 1)
Solubility	Practically insoluble in water: 0.006 g/L at 20ºC Completely soluble in ethanol 95 to 100% at 20ºC, and other organic solvents, such as acetone, methanol.
Partition coefficient: n-octanol/water	4.38 Log Pow
Decomposition temperature	Not available.
Viscosity	Dynamic: 0.99 mPa.s at 20°C Kinematic: 1.17 mm²/s at 20°C
Explosiveness properties	Not available.
Oxidizing properties	Not available.
Dissociation constant	Not available
Other information:	Surface tension 26 mN/m at 20ºC

10- STABILITY AND REACTIVITY	
Reactivity	It is a reactive substance, main risk of ignition.

	If heated, high risk of ignition, and vapors may form explosive mixture with air.
Chemical stability	Product is stable under normal conditions of temperature and pressure. But have some reactivity of oxidation when exposed to light and air.
Possibility of hazardous reactions	Vapours of the heated substance can form an explosive mixture in contact with air. May have violent reaction with strong oxidizer and acids.
Conditions to avoid	Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
Incompatible materials:	Strong oxidizing agents and mineral acids.
Hazardous decomposition products:	The thermal decomposition may release carbon monoxide and carbon dioxide.

11- TOXICOLOGICAL INFORMATION	
Information on toxicological effects (based on main compound d-Limonene)	
Acute toxicity	ORAL LD_{50} (rat) : 4400 mg/kg DERMAL LD_{50} (rabbit): > 4400 mg/kg
Workers (industry) inhalation exposure (long-term, chronic systemic effects), DNEL	66.7 mg/m3
Workers inhalation exposure (acute/short-term), DNEL	Not available
General population inhalation exposure (long-term), DNEL	7.78 mg/m3
General population inhalation exposure (acute/short term), DNEL	Not available
Skin sensitization/irritation	Causes skin sensitization and irritation with redness and dryness. Skin – Rabbit, result: Irritating to skin. (OECD Test Guideline 404).

Workers (industry) dermal irritation exposure (long-term, chronic systemic effects), DNEL	9.5 mg/Kg bw/day
Workers dermal exposure (acute/short-term), DNEL sensitization skin	185.8 ug/cm3
General population dermal exposure (long-term), DNEL sensitization skin	4.44 mg/Kg bw/day
General population dermal exposure (acute/short-term), DNEL sensitization skin	92.9 ug/cm3
Repeated dose toxicity	NOAEL (rat): 150-2400 mg/Kg bw/day NOAEL (mouse): 500 mg/Kg bw/day NOAEL (dog): 100 mg/Kg bw/day LOAEL (rat): 1200 mg/Kg bw/day LOAEL (mouse): 1000 mg/Kg bw/day
Oral exposure (long-term), DNEL	4.44 mg/Kg bw/day
Eye damage/irritation	Not available, but it is expected that the product causes eye irritation.
Genetic toxicity (in vitro)	No adverse effect observed (negative)
Genetic toxicity (in vivo)	Not available
Germ cell mutagenicity	Mouse (male, lymphocyte): negative
Carcinogenicity	Not classified as to carcinogenicity to humans. IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible, or confirmed human carcinogen by IARC. NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

	OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.
Reproductive toxicity	Due to partial or complete lack of data, the classification is not possible.
Specific target organ toxicity – single exposure	It is not expected that the product present specific target organ toxicity by single exposure.
Specific target organ toxicity – repeated exposure	Due to partial or complete lack of data, the classification is not possible. Repeated dose toxicity – mouse – male and female – No observed adverse effect level – 1,650 mg/Kg – Lowest observe adverse effect level 3,300 mg/Kg.
Aspiration hazard	May be fatal if swallowed and enters airways.
Interactive effects	There are not known substances capable of producing interactive effects with the product.

12- ECOLOGICAL INFORMATION	
Environmental effects, behavior, and fate of the product. (Based on main compound d-Limonene)	
Aquatic toxicity (short-term, acute)	Toxic to aquatic life with expected long-lasting effects. LC50 (fish, 96h exposure time): 0.46 mg/L EC_{50} (aquatic invertebrates, 48h): 0.307 mg/L EC_{50} (algae 72h): 0.32 mg/L
Aquatic toxicity (long-term, chronic)	Toxic to aquatic life with expected long-lasting effects. EC50 (fish, 8 days exposure time): < 0.67 mg/L EC_{50} (aquatic invertebrates, 21 days): 188 ug/L
Toxicity to soil and terrestrial microorganisms	Not available
Toxicity to terrestrial arthropods	Not available
Toxicity to terrestrial plants	Not available
Toxicity to birds	Not available

Hazard for aquatic organisms, PNEC Short-term (single instance)	Freshwater: 14 ug/L Intermittent releases (freshwater): 5.7 ug/L Marine water: 1,4 ug/L Sewage treatment plant: 1.8 mg/L Sediment (freshwater): 3.85 mg/Kg Sediment (marine water): 0.385 ug/Kg
Terrestrial organism (soil), short-term PNEC	0.763 mg/Kg
Hazard to air	Not available
Hazard for terrestrial organism	Soil: 261 ug/Kg
Hazard for predators (secondary poisoning)	No potential to cause toxic effects if accumulated (in higher organisms) via the food chain.
Persistence and degradability	The product does not have persistence and it is considered readily biodegradable. Degradation rate: 58.8% in 14 days – carbon dioxide generation process. Degradation rate: 80.0% in 28 days- oxygen depletion process.
Bioaccumulative potential	Presents high bioaccumulative potential in aquatic organisms. Log kow: 2.78 – 4.88
Mobility in soil	Data not available.
Other adverse effects	There are no known adverse environmental effects for this product.

13- DISPOSAL CONSIDERATIONS	
Waste treatment methods:	Must be disposed of as hazardous waste in compliance with local regulations. The treatment and disposal should be evaluated for each specific product. Keep the product remains in its original and properly closed. Disposal should be performed as established for the product. Do not reuse empty containers. These may contain product residues and

	should be kept closed and sent for proper disposal as established for the product.
Product	Burn in a chemical incinerator equipped with an afterburner and scrubber but exert extra care in igniting as this material is highly flammable. Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material.
Used packaging	Do not reuse empty containers. These may contain product residues and should be kept closed and sent for proper disposal as established for the product by local legislation.

14- TRANSPORT INFORMATION	
International regulations	
Land: ADR/RID/ADN	UN – "United Nations" European Agreement concerning the International Carriage of Dangerous Goods by Road – ADR RID – International Carriage of Dangerous Goods by Rail ADN – European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways.
UN number:	2319
UN proper shipping name:	TERPENE HYDROCARBONS, N.O.S.
Transport hazard class(es):	3
Subsidiary risk:	NA
Packing group:	III
Sea: IMDG	IMO – International Maritime Organization International Maritime Dangerous Goods Code (IMDG Code)
UN number:	2319
UN proper shipping name:	TERPENE HYDROCARBONS, N.O.S.

Transport hazard class(es):	3
Subsidiary risk:	NA
Packing group:	III
Marine pollutant:	Yes
EmS:	F-E, S-D
Air: ICAO-IATA-DGR	**ICAO** – International Civil Aviation Organization **IATA** – International Air Transport Association **DGR** - Dangerous Goods Regulation
UN number:	2319
UN proper shipping name:	TERPENE HYDROCARBONS, N.O.S.
Transport hazard class(es):	3
Subsidiary risk:	NA
Packing group:	III
Environmental hazards:	The product is considered a marine pollutant.
Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code:	Consult regulations: - International Maritime Organization. MARPOL: Articles, protocols, annexes, unified interpretations of the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto, consolidated edition. IMO, London, 2006. - International Maritime Organization. IBC code: International code for the construction and equipment of shipping carrying dangerous chemicals in bulk: With Standards and guidelines relevant to the code. IMO, London, 2007.

15- REGULATORY INFORMATION	
Safety, health and environmental regulations/legislation	Convention 170: Convention Concerning Safety in the Use of Chemicals at Work. 1990. Geneva: ILO. Regulation (EU) No 2037/2000 of 29 June 2000.

specific for the substance or mixture	Regulation (EU) No 1272/2008 of 16 December 2008. Regulation (EU) No 649/2012 of 4 July 2012. Regulation (EU) No 2019/1021 of 20 June 2019. ECHA - European Chemical Agency.
Directive on the restriction of the use of the certain hazardous substances in electrical and electronic equipments (RoHS)	Not listed.
Water Framework Directive (WFD)	Not listed
Regulation on the marketing and use of explosive precursors	Not listed.
Regulation on drug precursors	Not listed.
Regulation on substances that deplete ozone layer (ODS)	Not listed.
Regulation concerning the export and import of hazardous chemicals	Not listed.
Regulation on persistent organic pollutants (POP)	Not listed.
Restrictions according to GB REACH, Annex 17	d-(+) Limonene. This product meets the criteria for classification in accordance with regulation No. 1272/2008/EC (Class 3, Flammable liquid)
US Federal regulations Hazardous Chemical regulations	This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200

Toxic Substances Control Act (TSCA), TSCA – US (40 CFR 707, Subpt.D)	Not regulated.
Cercla Hazardous Substance List (40 CFR 302.4)	Not listed.
Superfund Amendments and Reauthorization Act of 1986 **(SARA)**- US SARA 302 – Extremely hazardous substance	Not listed.
SARA 304 Emergency release notification - US	Not regulated.
SARA 313 Components - US	Not applicable.
SARA 311/312 – Hazardous chemical	Yes. Flammable Liquid. Skin corrosion or irritation. Skin sensitization. Aspiration Hazard.
SARA 313 Components (TRI reporting)	Not regulated.
Safe Drinking Water Act (SDWA)	Not regulated.
Safe Drink Water Act (SDWA)	Not regulated.
Clean Air Act (CAA), Hazardous air pollutants (HAPs) /Accidental release Prevention (40 CFR 68,130)	Not regulated.

National Inventories

Australia AICS – Australian Inventory of Chemical Substances	Listed
Canada DSL – Domestic Substances List	Listed
China IECSC – Inventory of Existing Chemical Substances Produced or Imported	Listed
Europe ECSI – European Community Substance Inventory (EINECS/ELINC/ELP)	Listed
Europe EU-REACH – Registration, Evaluation, Authorization and Restriction of Chemicals	Listed
Japan CSCL-ENCS – Chemical Substance Control Law - Existing and New Chemical Substances	Listed
Korea KECI – Korea Existing Chemicals Inventory	Listed
Mexico INSQ – National Inventory of Chemical Substances	Listed
New Zealand NZIoC – New Zealand Inventory of Chemicals	Listed
Phlilippines PICCS – Philippine Inventory of Chemicals and Chemicals Substances	Listed
Taiwan TCSI – Taiwan Chemical Substance Inventory	Listed
Türkiye CICR – Chemical Inventory and Control Regulation	Not available
United States TSCA – Toxic Substance Control Act	Listed
Vietnam NCI - National Chemical Inventory	Listed

16- OTHER INFORMATIONS

This SDS was prepared based on best practices about the proper product handling and under normal conditions of use, in accordance with the application specified on the packaging. Any other use of the product involving their combination with other materials, and use various forms of those indicated, are the responsibility of the user. Warns that the handling of any chemical substance requires the prior knowledge of its hazards for the user. In the workplace it is for the user company's product promotes training of its collaborators about the possible risks arising from exposure to the chemical.

The information contained herein is based on current knowledge and experience, no responsibility is accepted that the information is enough or correct in all cases. Users should consider these data only as a supplement to other information obtained by the user. No warranty is expressed or implied regarding the accuracy of experimental data, the results to be obtained from the use thereof, or that any such use will not infringe any patent. Users should make independent determination of suitability and completeness of the information from all sources to assure proper use and disposal of these materials,

the safety and health of employees and customers, and the protection of the environment. This information is furnished upon the condition the person receiving it shall determine the suitability for the particular purpose. This SDS is to be used as a guideline for safe work practices and emergency response.
Caution: The user should conduct his own experiments and establish proper procedures and controls before attempting use on critical parts.

SDS Historical Document Information:

Rev.	Date	Information
0	October 20, 2025	SDS first version (1-2 T).

Abbreviations and acronyms:

EC/EU	European Community/Europe Union
FEMA	Flavor Extract Manufacturers Association, Institute of Food Technologists US
FLAVIS	EU Flavouring Information System
COE	Council of Europe
JECFA	Joint of Expert Committee on Food Additives
CFR	Code of Federal Regulations - US
ABNT	Technical Standards Brazilian Association.
REACH	Registration, Evaluation, Authorization, and restriction of Chemicals of EU.
CAS	Chemical Abstracts Service, CAS Registry number
UN	United Nations
ECHA	European Chemical Agency
EINECS	European Inventory of Existing commercial Chemical Substances.
ELINCS	European List of Notified Chemical Substances.
USDA	United States Department of Agriculture.
IMO	International Maritime Organization

IMDG	International Maritime code of Dangerous Goods.
IATA	International Air Transportation Association.
GHS	Globally Harmonized System of Classification and Labelling of Chemicals.
AOAC	Association of Official Analytical Collaboration International.
OSHA	Occupational Safety and Health Administration USA.
NIOSH	National Institute for Occupational Safety and Heath, USA.
NFPA	National Fire Protection Association USA.
EC_{50}	Effective Concentration 50%
EC_{10}	Effective Concentration 10%
LC_{50}	Lethal Concentration 50%
LD_{50}	Lethal Dose 50%
NA	Not applicable.
PVC	Polyvinyl Chloride.
SCBA	Self-Contained Breathing Apparatus
HACCP	Hazard Analysis and Critical Control Points.
PNEC	Predicted No Effect Concentration: the concentration value of a substance with adverse effects in the environment are not expected to occur.
DNEL or DN(M)EL	Derived No or Minimum Effect Level: is the level of exposure which a human should not be exposed to a substance.
Kg.b.w	Kilogram body weight
NOAEL	No Observed Adverse Effect Level, term used in toxicology.
LOAEL	Lowest Observable Adverse Effect Level, term used in toxicology.
SARA	US-EPA Superfund Amendments and Reauthorization Act
IARC	WHO International Agency for Research on Cancer
NTP	US Department of health and human services – National Toxicology Program

EPA	US Environmental Protection Agency
WHO	UN United Nations - World Health Organization
HMIS	Hazardous Materials Identification System – American Coating Association.

Bibliographic references:

ECHA EUROPEAN CHEMICAL AGENCY, http://echa.europa.eu

REACH - REGISTRATION, EVALUATION, AUTHORIZATION AND RESTRICTION OF CHEMICALS. Commission Regulation (EC) No 1272/2008 of December 2008 amending and repealing Directives 67/548/EEC and 1999/45/EC and amending Regulation (EC) No 1907/2006 of the European Parliament and of the Council on the Registration, Evaluation, Authorization and Restriction of Chemicals. Available in: <http://eurlex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2008:353:0001:1355:en:PDF>.

Access at: Oct. 2024.

USDA FDA United States Department of Agriculture, Food and Drugs Administration

ABNT Brazilian Association of technical Standards, NBR 14725 (2023) Chemical Products Informations about Safety, Health, and Environment. Guidelines for SDS (FDS).

VIGON.com – **Aroma compounds Properties database** – www.vigon.com

SDS-Safety Data Sheet - SIGMA ALDRICH – MERCK Brazil, www.sigmaaldrich.com

SDS-Safety Data Sheet – CARL ROTH, www.carlroth.com

SDS-Safety Data Sheet – BASF Germany, www.basf.com

SDS-Safety Data Sheet – IFF - www.iff.com

SDS-Safety Data Sheet – THERMOFISHER Scientific – www.thermofisher.com

SDS-Safety Data Sheet – VIGON – www.vigon.com

PUBCHEM US-National Library – pubchem.ncbi.nlm.nih.gov

Quality Control Manual for Citrus Processing Plants, James.B. Redd., Charles M. Hendrix Jr and Donald L. Hendrix, INTERCIT INC, Florida USA, 1986.

RSK Values, the complete manual – Guide values and ranges of specific numbers, including the revised method of analysis, VdF – Association of the German Fruit Juice Industry, Bonn. 1987.

AOAC Association of Official Analytical Collaboration International, www.aoac.org

IMO International Maritime Organization, Sub-commitee of dangerous goods, solid cargos and containers.

OSHA OCCUPATIONAL SAFETY AND HEATH ADMINISTRATION, USA, www.osha.gov.

EPA USA Environmental Protection Agency, Washington http://www.epa.gov

HSDB HAZARDOUS SUBSTANCES DATA BANK. http://toxnet.nlm.nih.gov

IARC INTERNATIONAL AGENCY FOR RESEARCH ON CANCER.http://monographs.iarc.fr

IPCS INTERNATIONAL PROGRAMME ON CHEMICAL SAFETY – INCHEM

IUCLID INTERNATIONAL UNIFORM CHEMICAL INFORMATION DATABASE European chemical Bureau.

NIOSH NATIONAL INSTITUTE OF OCCUPATIONAL AND SAFETY. International Chemical Safety Cards.

SIRETOX/INTERTOX – CHEMICAL EXPOSITION RISK DATABASE.

Technical paper: Odour and flavor threshold for key aroma components in an orange juice matrix: Terpenes and aldehydes; Anne Ploto and others, Flavor and Fragrance Journal, 2004, 19: 491-498.